Comments/Concerns with the Proposed Remedial Action for the former Hercules Property/Delaware National Country Club Property March 2007

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1. The phase I ESA states "the western portion of the subject property was developed into a golf course from agricultural land between 1937 and 1954". How did the golf course evolve during this time period?

2. Additionally the only thing that sometimes distinguishes the fairway from the rough is simply how long the grass is - where the area is actually mowed. On old some aerial photographs, the area where the original holes are located appears to be quite open, with little or no vegetation. Even at present, most of the course is still quite open, without a lot of trees or natural barriers and the holes may have modified over the years. Was this part of the investigation?

3. According to the Phase I ESA, no history was given prior to 1937 other that the land was used for agricultural purposes. Is no information prior to that date available? What buildings were located on the property prior to that date?

4. Was the golf course history reviewed for changes to the layout of the tees/greens/fairways over the years? Tees and fairways are sometimes moved or modified to change the way the hole is played. How was the golf course reconfigured when the 2 newer holes were added in the 1970s?

5. The black and white copies of the aerial photographs which are available in the ESA are not very good quality and it is difficult to discern a lot of detail. Labels obscure the views of the golf course. Are the actual photographs available for review?

6. The entire area designated area "A" on the map accompanying the Proposed Remedial Action is **not** a tee, green, or fairway, but elevated levels of Arsenic and other contaminants were found here, and it is targeted for "blending".

If a sampled area which was not a tee, green or fairway did happen to exhibit an elevated level of contaminants, the small localized area at that particular sampling location has been included in the areas to be blended, while surrounding adjacent areas have not even been sampled for anything.

There are a number of sample locations (including area "A") that do not fit the conceptual model that the contamination is confined to the tees, greens, and fairways.

This conceptual model drove the remedial investigation and site characterization. **The conceptual model should have been reevaluated when contamination was found in**

other areas which did not fit the model. There are other large open areas like area"A" which have not been sampled for anything, and which will be left in place during remediation, but moved around freely during construction.

The following sampling locations areas had elevated levels of one or more contaminant and do not appear to be located on a tee, green or fairway:

PH-17 (near 8th tee)
PH-68 (near 9th fairway)
PH-55 (between 9th tee and fairway)
PH-33 (near research building – Area "A")
TF-1 (near research building – Area "A")
PH-22 (open area east of practice greens – Area "A")
PH-47 (open area east of practice greens – Area "A")
PH-48 (near cart path)
PH-31 (adjacent to 4th fairway)
SB-8 (southwest of 4th green – in southern wooded parcel supposedly "not impacted by golf course activities")

7. There also appears to have been no sampling of any of the sand traps. Although sand in the traps may not have a tendency to accumulate pesticide residues, the soil under it certainly can. The traps are directly adjacent to the greens and fairways, are bowl shaped, and act as catch basins for runoff. Additionally, herbicides may have been applied to keep them free of unwanted vegetation.

8. Given the pesticide logs that we do have, were samples actually tested for residues of the actual chemicals applied or was a general screening performed?

What were the Target Analyte Lists (TALs) and Target Compound Lists (TCLs) used? What methodology was used to determine the lists?

9. Some of the pesticides listed in the logs were often contaminated with dioxins(especially 2,3,7,8 TCDD) from the actual manufacturing process(they were not an active ingredient of the pesticide) particularly in 2,4,5 T(commonly used beginning in the 1940s right through early 1970s and would likely have been applied during this time period) 2,4 D (which is noted in the logs from 1973 - a number of times), also Dacthal (noted on the log in the 1970s and was commonly in use since 1958 on and probably also applied prior to the 1970s).

I did find a reference from the Oregon Department of Environmental Quality providing guidance for the Evaluating Residual Pesticides on Lands Formerly Used for Agricultural Production dated Jan 2006. They require/recommend sampling for dioxins when these pesticides have been used (2,4,5T and 2,4D). Contamination of pesticides with dioxins is discussed in sections 6 and 9 of the document.

http://www.deq.state.or.us/lq/pubs/docs/cu/GuidanceEvalResidualPesticidesLandsAgProduction.pdf

Although a small number of samples were analyzed for 2,4,D and 2,4,5 TP, these pesticides themselves are not known to persist in the soil for long, although the dioxins which commonly contaminated the 2,4,5 T, the 2,4,D and Dacthal, and perhaps other pesticides, are known to persist in the soil for **decades** and are highly toxic to humans and the environment. Since DNREC does have a URS level for protection of human health soil level for 2,3,7,8 TCCD, the most toxic of the dioxin contaminants and it is very low(4 parts per trillion?). It could easily eclipse arsenic as a Contaminant of Concern and samples should be collected and analyzed for it.

2,3,7,8 TCCD is also on the EPA's Priority Pollutant List for the Clean Water Act and should have been evaluated in sediment, and surface and groundwater samples.

10. Was the actual mixing or storage of pesticides and cleaning of equipment performed on the property? If so, has that area been evaluated?

11. The southwest corner of the property is currently a low-lying drainage area and only 1 sample was collected in this area, and not at the lowest areas. As a resident who can see most of the golf course from my windows, I have observed the tremendous amounts of runoff and sediment that makes its way into this area during heavy rains. This single sample was tested **only** for arsenic. This area is will be used for storm water management (a pond) according to the proposed development B/Ps and should have been investigated further, as should the other storm water management areas on the property.

Additionally, the property has rolling topography with many low-lying areas and drainage areas where runoff accumulates during heavy precipitation events. Were efforts made to evaluate these areas where contaminants might tend to accumulate? I have personally observed many of these large puddles and temporary lakes from my windows.

12. The large wooded area to the west of the property has never been sampled, even though a large portion of it will be developed into residential lots.(Although I did already receive a partial answer to this question, holes #6 and #7 still received over 30 years worth of pesticide applications, and not many of the possible pesticide residues were evaluated, in fact many of the samples were tested only for Arsenic and pesticides used prior to the construction of the holes).

The older aerial photos (1937 and 1954) appear to show that southern half of this wooded area was quite open. Was the history of this part of the property investigated in more detail?

13. There has been **no** analysis for VOCs and SVOCs on the greens, tees, and fairways.

14. The only samples tested for VOCs and SVOCs were the 10 "HSCA" investigation sample locations with the label S01 – S10. They were collected from areas which were **not** suspected to have been impacted by golf course activities. **None** were collected from the areas where the preliminary investigations revealed the highest levels of contaminants.

VOCs and SVOCs may be present on or near the greens, tees, and fairways, where they would have been applied in pesticide mixtures with the greatest frequency.

Without any analytical results for these, it is impossible to predict what hazards may exist to site workers, area residents, and future residents of the new homes as the property is excavated and prepared for construction.

15. We do not have any comprehensive analysis for what is actually in the soil which will be excavated or blended, or left in place to be moved after the remediation is complete, since the conceptual model using Arsenic as the Contaminant of Concern was used to determine the most of the sampling on the property, and in many sample locations, Arsenic was the **only** contaminant tested for. Many acres of the property remain completely untested.

16. Based on the site age and history, more sampling and analysis should have been performed for other Potential Contaminants of Concern - e.g. pesticides (and their **degradates and metabolites**) which are **listed** in the application logs for the property, toxic contaminants of some of the pesticides (TCDD and other dioxins), and inert ingredients applied with the active ingredients of the pesticides).

Additional sampling may indicate that there are other Contaminants of Concern that contribute more significantly to the Health Risk Analysis than Arsenic.

17. The pesticides applied would likely have drifted and been oversprayed onto other areas adjacent to the application areas. To presume it only landed on the areas defined on site maps as the greens, tees, and fairways is ridiculous. Both sprays and powders have a tendency to drift as they are applied. Since I live adjacent to the property, I have personally observed the drift which occurs (and unfortunately sometimes smelled it).

18. This entire process of evaluating residual pesticide residues on golf courses (and agricultural land) is an emerging new problem which cities, towns and states are wrestling with all over the country. We have **no** experience with it in the state of Delaware (to date I have found no other contaminated golf course properties anywhere in the country which have been remediated for unrestricted residential use). How many golf courses can Brightfields say it has remediated? How many golf course remediations have DNREC been involved with?

As the pesticide logs illustrate, the number and amounts of different chemicals applied over the years to this property are staggering. We are told by Brightfields that many of the compounds applied don't have URS levels in DNREC's guidelines so they did not analyze for them, even though many of them are suspected to be carcinogens or are otherwise suspected of being toxic to humans. The fact that they are still being evaluated does **not** mean that they are not hazardous.

Current and future residents do not wish to be treated like guinea pigs in an experiment gone awry. The proposed plan leaves too many questions unanswered and is not protective of human health and the environment.